

## ABSTRACT OF THE DISCLOSURE

A method for controlling the non-uniformities of plasma-processed semiconductor wafers by supplying the plasma with two electrical signals: a primary electrical signal that is used to excite the plasma, and a supplemental electrical signal. The supplemental signal may be composed of a plurality of electrical signals, each with a frequency harmonic to that of the primary signal. The phase of the supplemental signal is controlled with respect to the phase of the primary signal. By adjusting the parameters of the supplemental signal with respect to the primary signal, the user can control the parameters of the resultant plasma and, therefore, control the non-uniformities induced in the semiconductor wafer.